

Fixed to Mobile Substitution

The evidence and its implications

Are fixed and mobile telephony substitutes or complements – that is the question increasingly being asked. If they are complements, then the current approach to communications’ regulation, merger policy and antitrust rests on solid foundations. But if they are substitutes, then regulation will have to be re-thought, and this will have major implications for the strategy of operators, particularly fixed operators. Here we examine the published evidence and its implications.

The Issues

On price, functionality, penetration and coverage mobile telephony was in the early stages of its development clearly a different physical and economic product to the established fixed voice telephony. Over the last decade competition in, and regulation of, the mobile sector has increased, as it has its penetration and coverage. As a result prices have fallen, thus progressively narrowing the large ‘gap’ between mobile and fixed retail tariffs. Further, in many countries the growth of fixed lines and usage has stalled or declined at the same time as mobile growth has accelerated. The inference that many have drawn from this correlation is that mobile and fixed services now compete, and are substitutes in consumers’ eyes.

The research to date tends, with some exceptions, to examine whether the diffusion of mobile and fixed services move in parallel or inversely, holding all other factors constant. That is they seek to establish whether mobile and fixed lines are *access substitution*. Access substitution occurs when subscribers make a choice between a mobile or fixed line and opt for one over the other. This is often difficult to empirically estimate since subscribers may use fixed lines for data traffic, or decrease the number of fixed lines by subscribing to two-line broadband connections. Another type of consumer substitution is *call/usage substitution* i.e. when individuals who have access to both mobile and fixed lines use one more than the other in response to price and quality differences/changes. This is more difficult to test for and estimate as it requires data on prices and call minutes over time and between countries which is often unavailable on a consistent basis.

The Evidence

The table overleaf summarises the results of 11 studies, which vary in rigour, country, age, and findings:

- some find that they are access complements i.e. penetration or number of lines rise together;
- others that they are access substitutes however the effect tends to be small;
- two studies estimate the effects of price on access substitution - Hausman (1997) estimates a low ‘price elasticity’ of -0.51 for number of mobile subscribers to monthly bills; Parker & Roller (1997) report ‘elastic’ mobile demand with an implicit own price elasticity of -1.5. However these findings are dated, deal with duopoly mobile markets in the US, and Receiving Party Pays and unmetered local mobile prices; all of which differ from the position in most countries today; and
- only one study examines call substitution and finds that mobiles and fixed usage are substitutes (Dotecon, 2001).

Conclusion

These studies present a mixed picture. This is not surprising given that they deal with very different mobile ‘markets’ at different stages of development. On balance they show that mobiles are displacing fixed lines in countries with mature mobile markets, and those with immature fixed markets. However, the access substitution effects are not strong and certainly not strong enough to place fixed and mobile services in the same regulatory and antitrust markets based, say, on the SSNIP test. Indeed, a notable feature of these studies is the absence of any analysis of the impact of retail tariffs on mobile/fixed penetration.

On the other hand the mobile markets of the late 1990s and earlier differ significantly from those today – they had lower penetration rates, higher prices, and were less competitive. It is therefore reasonable to assume that today fixed/mobile substitution is likely to be more pronounced especially in light of some of the significant declines in the number fixed lines that have recently been reported. But whether this is sufficient to make them economic access and call substitutes, and for a radical re-think of telecom regulation remains an open question.

Study	Countries/Period	Mobile penetration (% pop.)/no. mobile operators	Findings
Hausman (1997)	USA 1989-1993	penetration 2% in 1989/duopoly	Access substitutes – mobile average monthly bill elasticity -0.51.
Parker & Roller (1997)	USA 1984-1988.	penetration low/ monopoly to duopoly	Access substitutes - mobile revenue elasticity -1.5.
Gruber & Verboven (1999)	140 countries 1981-1997	penetration between 0.4% - 5.2% in 1995/varying number of operators	Access complements to 2007
Barros & Cadima (2000)	Portugal 1981–1993 1994 –1999	penetration from zero to greater than fixed by 1999/one to three operators	Access substitutes - fixed line penetration 10% lower than in absence of mobiles
OECD (2000)	Scandinavia 1989-1997	penetration between 44 – 61%/one to three operators	Fixed tariffs were restructured as mobile exceeds fixed penetration
Dotecon (2001)	UK 1999-2001 Multi-country 1990-1999	penetration in UK 15% in 1999/four operators Multicountry penetration varies considerably	Call substitutes using UK longitudinal data/access substitutes based on cross – country analysis
Gruber & Verboven (2001)	EU15 1984-1997	EU15 average penetration 23.5%/moving from one to four operators	Access substitutes
Sung, Kim & Lee (2001)	South Korea - regional panel data 1991-1998	penetration 50% in 1999/monopoly to five operators	Access substitutes with elasticity -0.1 to -0.2
Hausman (2002)	Australia 1997-2000, Ireland 2000-01, Korea 1999-2000; US 1988-2001	penetration: Australia 27% in 1997 to 53% in 2000; Ireland 70% (2001); and Korea 58% (2000)/ three to four operators.	Access substitutes. Estimated critical loss for Australia 5.9%
Woroch (2002)	USA 1997-2000	penetration 25.5% in 1998/duopoly to seven operators.	Access substitutes & complements
Hamilton (2003)	Africa 1985-1997	penetration varied 0.0004 % in 1987 - 0.03% in 1997/ one, two and more operators.	Access substitutes & complements

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